

REMARKS**Summary of the Office Action**

Claims 1, 2 and 4 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto (U.S. Patent No. 6,002,435) (hereinafter "Yamamoto").

Claims 1 and 4 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto.

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto¹ in view of Henderson et al. (U.S. Pub. No. 2002/0051067) (hereinafter "Henderson").

Claims 1-4 stand provisionally rejected under the judicially created doctrine of non statutory obviousness-type double patenting as being unpatentable over claims 1-3 of co-pending application no. 10/539,067 (U.S. Pub. No. 2006/0231748) in view of Yamamoto.

Summary of the Response to the Office Action

Applicants have amended independent claim 1 by adding features of previous claim 4 to independent claim 1. Accordingly, claim 4 has been canceled without prejudice or disclaimer. In addition, independent claim 1 has been newly-amended to include new features that differently describe embodiments of the disclosure of the instant application. Accordingly, claims 1-3 remain currently pending and under consideration. A Terminal Disclaimer is submitted herewith.

¹ Applicants understand that the Office Action's references to "Yamoto" at page 4 were intended to be references to Yamamoto. Accordingly, Applicants proceeded with this understanding in today's as-filed papers. However, to the extent that this understanding is incorrect, the Examiner is requested to provide clarification in the next Office Communication.

Double Patenting Rejection

Claims 1-4 stand provisionally rejected under the judicially created doctrine of non statutory obviousness-type double patenting as being unpatentable over claims 1-3 of co-pending application no. 10/539,067 (U.S. Pub. No. 2006/0231748) in view of Yamamoto. While Applicants do not necessarily concede to these rejections, Applicants submit a Terminal Disclaimer to facilitate allowance of the present application, thereby obviating the double patenting rejections. Accordingly, Applicants request that the double patenting rejections be withdrawn.

Rejection under 35 U.S.C. §§ 102(b) and 103(a)

Claims 1, 2 and 4 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto. Claims 1 and 4 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto. Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto in view of Henderson. Applicants have amended independent claim 1 by adding features of previous claim 4 to independent claim 1. Accordingly, claim 4 has been canceled without prejudice or disclaimer. In addition, independent claim 1 has been newly-amended to include new features that differently describe embodiments of the disclosure of the instant application. To the extent that these rejections might be deemed to still apply to the claims as newly-amended, they are respectfully traversed for at least the following reasons.

Applicants respectfully submit that a photodetector, as described in newly-amended independent claim 1 of the instant application, includes the following three advantageous characteristics (a) to (c).

(a) The photodetector comprises:

$(M \times N)$ integrating circuits, one of each being provided in correspondence to K photodiodes $PD_{k,m,n}$ ($k = 1$ to K) among the $(K \times M \times N)$ photodiodes $PD_{k,m,n}$ and each successively inputting and accumulating the electric charges generated at the K photodiodes $PD_{k,m,n}$ ($k = 1$ to K) and outputting a voltage that is in accordance with the amount of the accumulated electric charges.

(b) The photodetector comprises:

$(M \times N)$ filter circuits, one of each being provided in correspondence to each of the $(M \times N)$ integrating circuits and each reducing the thermal noise component contained in the voltage output from the corresponding integrating circuit and outputting the voltage after reduction of the thermal noise component.

(c) In the photodetector,

the $(K \times M \times N)$ photodiodes $PD_{k,m,n}$ are arranged in M rows and $(K \times N)$ columns either two-dimensionally (when $M = 2$) or one-dimensionally (when $M = 1$), with each photodiode $PD_{k,m,n}$ being positioned at the position of the m -th row and $(n + (k - 1)N)$ -th column.

Applicants respectfully submit that due to the above-discussed characteristics (a) and (b), the thermal noise component contained in the voltage output from integrating circuit 20_{m,n} is reduced by filter circuit 40_{m,n}. Also, the operations from the electric charge accumulation in integrating circuit 20_{m,n} to the A/D conversion in A/D converter 50_{m,n} are carried out at each time $(N \times T)$. Thus, Applicants respectfully submit that with this photodetector 1, the S/N ratio of

photodetection can be improved while maintaining high speed of photodetection. See, for example, paragraph [0041] of the specification and Fig. 2 of the instant application.

Applicants respectfully submit that due to the above-discussed characteristic (c), the processes (electric charge accumulation, CDS, filtering, and A/D conversion) regarding photodiodes $PD_{k,m,n}$ are carried out in the order of alignment in each column for each row, and the storage and image processing of the photodetection data obtained by the photodetector 1 are facilitated. See, for example, paragraph [0044] of the specification and Fig. 2 of the instant application.

Applicants respectfully submit that non of the cited references, whether taken separately or in combination, teach, or even suggest, at least these advantageous characteristics (a) to (c) as described in newly-amended independent claim 1 of the instant application.

In addition to adding the features of previous claim 4 into independent claim 1, Applicants have also added additional features to differently describe embodiments of the disclosure of the instant application. For example, the additional amendments to independent claim 1 describe a configuration as shown in Fig. 2 of the instant application in that switches $SW_{k,m,n}$ are provided in a one-to-one correspondence with respect to photodiodes $PD_{k,m,n}$ and are arranged between the photodiodes $PD_{k,m,n}$ and signal lines $SL_{m,n}$. Also, each set of K photodiodes $PD_{k,m,n}$ ($k=1$ to K) is connected via the corresponding switches $SW_{k,m,n}$ to a signal line $SL_{m,n}$. In addition, each signal line $SL_{m,n}$ is connected to an input end of an integrating circuit $20_{m,n}$. Also, as shown in Fig. 2, switches $SW_{k,m,n}$ on the same row are connected to the same control line $CL_{k,n}$ and the opening/closing of each row of switches $SW_{k,m,n}$ is controlled together by a control signal that is transmitted via the control line $CL_{k,n}$. Applicants respectfully

submit that these additional features are supported, for example, by paragraph [0020] of the specification and Fig. 2 of the instant application.

Accordingly, Applicants respectfully assert that the rejections under 35 U.S.C. §§ 102(b) and 103(a) should be withdrawn because neither of Yamamoto nor Henderson teach or suggest each feature of claim 1 of the instant application, as newly-amended. As pointed out in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim." Thus, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987)." Similarly, MPEP § 2143.03 instructs that "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." In *re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

Furthermore, Applicants respectfully assert that the dependent claims are allowable at least because of their dependence from independent claim 1, and the reasons discussed previously.

CONCLUSION

In view of the foregoing, Applicants submit that the pending claims currently under consideration are in condition for allowance, and respectfully request reconsideration and timely allowance of these claims.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required, including

any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573.

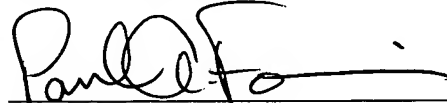
This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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